SEQUENCE LISTING

<110> FUKUCHI, NAOYUKI KITO, MORIKAZU KAYAHARA, TAKASHI FUTAKI, FUMIE ISHIKAWA, KOHKI SUZUKI, EIICHIRO GONDOH, KEIKO SHIMBA, NOBUHISA YAMADA, NAOYUKI

<120> PROTEIN HAVING ANTITHROMBOTIC ACTIVITY AND METHOD FOR PRODUCING THE SAME

<130> 214760US0

<140> US 09/969,763

<141> 2001-10-04

<150> JP 2000-305279

<151> 2000-10-04

<160> 50

<170> PatentIn version 3.1

<210> 1

<211> 126 <212> PRT <213> Crotallus horridus

Asp Leu Glu Cys Pro Ser Gly Trp Ser Ser Thr Asp Arg Tyr Cys Tyr 5 10 15

Lys Pro Phe Lys Gln Glu Met Thr Trp Ala Ser Ala Glu Arg Phe Cys 20 25 30

Ser Glu Gln Ala Lys Gly Gly His Leu Leu Ser Val Glu Thr Ala Leu 40

Glu Ala Ser Phe Val Asp Asn Val Leu Tyr Ala Asn Lys Glu Tyr Leu

Thr Arg Tyr Ile Trp Ile Gly Leu Arg Val Gln Asn Lys Gly Gln Pro

Cys Ser Ser Ile Ser Tyr Glu Asn Leu Val Asp Pro Phe Glu Cys Phe 85 90

Glu Gln Gln His Ser Phe Ile Cys Lys Phe Thr Arg Pro Arg 120 2 <210> <211> 690 DNA <212> Crotalus harridus <213> <220> <221> CDS (66)...(512) <222> <223> <400> 2 ctgagcagac ttgctacctg tggaggccga ggaacagttc tctctgcagg gaaggaaaga 60 acgcc atg ggg cga ttc atc ttc gtg agc ttc aac ttg ctg gtc gtg ttc 110 Met Gly Arg Phe Ile Phe Val Ser Phe Asn Leu Leu Val Val Phe 10 158 ctc tcc cta agt gga act cta gct gat ttg gaa tgt ccc tcc ggt tgg Leu Ser Leu Ser Gly Thr Leu Ala Asp Leu Glu Cys Pro Ser Gly Trp tet tee tat gat egg tat tge tae aag eec tte aaa eaa gag atg ace 206 Ser Ser Tyr Asp Arg Tyr Cys Tyr Lys Pro Phe Lys Gln Glu Met Thr 254 . tgg gcc gat gca gag agg ttc tgc tcg gag cag gcg aag ggc ggg cat Trp Ala Asp Ala Glu Arg Phe Cys Ser Glu Gln Ala Lys Gly Gly His 55 ctc ctc tct gtc gaa acc gcc cta gaa gca tcc ttt gtg gac aat gtg 302 Leu Leu Ser Val Glu Thr Ala Leu Glu Ala Ser Phe Val Asp Asn Val 70 65 ctc tat gcg aac aaa gag tac ctc aca cgt tat atc tgg att gga ctg 350 Leu Tyr Ala Asn Lys Glu Tyr Leu Thr Arg Tyr Ile Trp Ile Gly Leu 80 agg gtt caa aac aaa gga cag cca tgc tcc agc atc agt tat gag aac Arg Val Gln Asn Lys Gly Gln Pro Cys Ser Ser Ile Ser Tyr Glu Asn 105 100 ctg gtt gac cca ttt gaa tgt ttt atg gtg agc aga gac aca agg ctt 446 Leu Val Asp Pro Phe Glu Cys Phe Met Val Ser Arg Asp Thr Arg Leu 120 115 cgt gag tgg ttt aaa gtt gac tgt gaa caa caa cat tct ttc ata tgc 494 Arg Glu Trp Phe Lys Val Asp Cys Glu Gln Gln His Ser Phe Ile Cys

Met Val Ser Arg Asp Thr Arg Leu Arg Glu Trp Phe Lys Val Asp Cys 105

100

135

130

140

		•									
aag ttc acg Lys Phe Thr 145	cga cca Arg Pro	cgt taag Arg	atccg	gg ct	:gtgt	gaag	, tct	ggag	gaag		
caaggaagcc	ccccaccto	ct ccccac	cccc	caco	cttc	cg c a	atct	ctgo	ct ct	tccc	cctt
tgctcagtgg	atgetete	tg ·tagccg	ggatc	tgg	gttt	tct 9	gctco	agat	99	gtcag	gaaga
tccaataaat	tctgccta	c c caaaa	aaa						•		
<210> 3 <211> 149 <212> PRT <213> Crot	alus har:	ridus									
<400> 3											
Met Gly Arg	Phe Ile 5	Phe Val	Ser 1		Asn 10	Leu i	Leu `	Val	Val	Phe 1 15	Leu
Ser Leu Ser	Gly Thr	Leu Ala	Asp :	Leu 25	Glu	Cys	Pro	Ser	Gly 30	Trp	Ser
Ser Tyr Ası 35	Arg Tyr	Cys Tyr	Lys 40	Pro	Phe	Lys	Gln	Glu 45	Met	Thr	Trp
Ala Asp Ala 50	a Glu Arg	Phe Cys 55	Ser	Glu	Gln	Ala	Lys 60	Gly	Gly	His	Leu
Leu Ser Va 65	l Glu Thr	Ala Leu 70	Glu	Ala	Ser	Phe 75	Val	Asp	Asn	Val	Leu 80
Tyr Ala As	n Lys Glu 85	Tyr Leu	Thr	Arg	Tyr 90	Ile	Trp	Ile	Gly	Leu 95	Arg
Val Gln As	n Lys Gly 100	, Gln Pro	Cys	Ser 105	Ser	Ile	Ser	Tyr	Glu 110	Asn	Leu
Val Asp Pr 11		ı Cys Phe	Met 120	Val	Ser	Arg	Asp	Thr 125	Arg	Leu	Arg
Glu Trp Ph 130	e Lys Val	l Asp Cys		Gln	Gln	His	Ser 140	Phe	Ile	Cys	Lys
Phe Thr Ar 145	g Pro Arç	3									

		•	
<210>	14	•	
<211>	30	•	
<212>	DNA		•
<213>	ARTIFICIAL SEQUENCE		
10101			•
<220>			
<223>	SYNTHETIC DNA		
<400>	4		
attoga	tcca tggatttgga atgtccctcc		30
accyga	2004 055400055		
<210>	5		
<211>	26		
<212>	DNA		
<213>	ARTIFICIAL SEQUENCE	•	•
\Z1J/	ARTITICIAN SHOOMEN		
<220>			
<223>	SYNTHETIC DNA		
<400>	5		
~~~~~	acaa aataaaaaat caatta		26
ggacag	ccag cctccagcat cagtta		20
	•		
<210>	6		
<211>			
	30		
<212>	DNA		•
	·		
<213>	ARTIFICIAL SEQUENCE		
.220.			
<220>			
<223>	SYNTHETIC DNA		
<400>	6		
			3.0
aataag	ctta acgtggtcgc gtgaacttgc		30
<210>	7		
<211>	26		
<212>	DNA		
<213>	ARTIFICIAL SEQUENCE		
<220>			
<223>	SYNTHETIC DNA		
~~~			
<400>	7		
gatgct	ggag gctggctgtc ctttgt		26
_			
<210>	8		
		_	
<211>	54	•	
<212>			
<213>	ARTIFICIAL SEQUENCE		
	-		
<220>			
	CIDIMURMI O DAIA		
<223>	SYNTHETIC DNA		

<400> 8
tatatctgga ttggactgag gggcggtgga ggtgaatgtt ttatggtgag caga

54

<210> 9

<211> 54

<212> DNA

<213> ARTIFICIAL SEQUENCE

<220>

<223> SYNTHETIC DNA

<400> 9

tetgeteace ataaaacatt cacetecace geceeteagt ecaatecaga tata

54

<210> 10

<211> 110

<212> PRT

<213> ARTIFICIAL SEQUENCE

<220>

<223> SYNTHETIC PEPTIDE

<400> 10

Asp Leu Glu Cys Pro Ser Gly Trp Ser Ser Tyr Ser Arg Tyr Cys Tyr 1 5 10 15

Lys Pro Phe Lys Gln Glu Met Thr Tyr Ala Asp Ala Glu Arg Phe Cys
20 25 30

Ser Glu Gln Ala Lys Gly Gly His Leu Leu Ser Val Glu Thr Ala Leu 35 40 45

Glu Ala Ser Phe Val Asp Asn Val Leu Tyr Ala Asn Lys Glu Tyr Leu 50 55 ' 60

Thr Arg Tyr Ile Trp Ile Gly Leu Arg Phe Phe Phe Phe Glu Cys Phe 65 70 75 80

Met Val Ser Arg Asp Thr Arg Leu Arg Glu Trp Phe Lys Val Asp Cys 85 90 95

Glu Gln Gln His Ser Phe Ile Cys Lys Phe Thr Arg Pro Arg 100 105 110

<210> 11

<211> 24

<212> <213>	ARTIFICIAL SEQUENCE				
<220> <223>	SYNTHETIC DNA				
<400> caagcc	11 cttc gcacaagaga tgac				24
<210> <211>	12 24	.		:	
<212> <213>	DNA ARTIFICIAL SEQUENCE			. •	
<220> <223>	SYNTHETIC DNA				
<400> gtcatc	12 tett gtgegaaggg ettg				24
<210>	13			•	-
<211><212><213>	24 DNA ARTIFICIAL SEQUENCE				
<220> <223>	SYNTHETIC DNA				
<400> gcatco	13 etttg tggccaagtg gctc				24
<210><211><211><212><213>					
<220> <223>	SYNTHETIC DNA				
<400> gagcac	14 cattg gccacaaagg atgc				24
<210><211><212><212><213>	DNA				• .
<220> <223>					
<400> gacaat	15 tgtgc tcgctgcgaa caaag				25

	<210>	16	•
	<211>	25	
	<212>	DNA	
	<213>	ARTIFICIAL SEQUENCE	,
	12200		
		·	
	<220>		
	<223>	SYNTHETIC DNA	
	<400>	16	•
-			25
	cerege	cgc agcgagcacá ttgtc	
	<210>	17	
	<211>	24	
	<212>	DNA	•
			•
	<213>	ARTIFICIAL SEQUENCE	
	<220>	•	•
	<223>	SYNTHETIC DNA	
	(2237	Siningire Divis	•
		• •	
	<400>	17	
	ctatge	gaac gcagagtacc tcac	24
	-		
			•
	<210>	18	·
	<211>	24	
	<212>	DNA	
	<213>	ARTIFICIAL SEQUENCE	
	(213)	ARTIFICIAL DECORNOR	
	<220>		
	<223>	SYNTHETIC DNA	
	<400>	10	
			2
	gtgagg	tact ctgcgttcgc atag	2
			•
		•	
	<210>	19	•
	<211>	23	
	<212>		
	<213>	ARTIFICIAL SEQUENCE	
	<220>		
		CVAMILETTO DAY	
	<223>	SYNTHETIC DNA	
	<400>	19	
		aaag cgtacctcac acg	
	303000		_
	<210>	20	•
	<211>	23	
	<212>	DNA	
			·
	<213>	ARTIFICIAL SEQUENCE	
	<220>		

<223> SYNTHETIC DNA

<400> cgtgtga	20 ggt acgctttgtt cgc	·		•			23
•							
<210>	21					٠	•
<211> <212>	24 DNA						
<212>	ARTIFICIAL SEQUENCE						
10201					•		
<220>							
<223>	SYNTHETIC DNA			•			
400-	21						
<400>	aaag aggccctcac acgt						24
909000							
<210>	22				•		•
<211>	24 DNA						
<212> <213>	ARTIFICIAL SEQUENCE						
(213)	ARTITION						
<220>			•				
<223>	SYNTHETIC DNA						
<400>							•
acatat	gagg gcctctttgt tcgc						24
405050							
	1_					•	٠.
<210>	23						
<211> <212>	22 DNA	•			•		
<213>	ARTIFICIAL SEQUENCE						
1220							
<220>							
<223>	SYNTHETIC DNA						
<400>	23						
qtacct	caca gcttatatct gg						22
3							
0.7.0	24						
<210> <211>	24 22						
<211>	DNA						
<213>	ARTIFICIAL SEQUENCE						
<220>							
<223>	SYNTHETIC DNA						
<400>	24						0.0
ccaga	tataa gctgtgaggt ac						22
.010	25						
<210> <211>							
<211>							
<213>							

<220> <223>	SYNTHETIC DNA		
<400>	25 acgt gctatctgga ttgg		· 24
	, , , , , , , , , , , , , , , , , , , ,		
<210>	26		
<211> <212>	DNA		
<213>	ARTIFICIAL SEQUENCE	•	
<220>	AUTOMOTICA DIVI	·	
<223>	SYNTHETIC DNA		
<400>	26	•	
ccaatc	caga tagcacgtgt gagg		24
	-		
<210> <211>	27 22	•	
<212>	DNA		
<213>	ARTIFICIAL SEQUENCE		
<220>			
<223>	SYNTHETIC DNA		
<400>	27		
atggtg	agcg cagacacaag gc	•	22
•	•	•	
<210>	28		
<211>			
<212> <213>	DNA ARTIFICIAL SEQUENCE		
<220>			
<223>	SYNTHETIC DNA	•	
<400>	28		
gccttg	tgtc tgcgctcacc at		22
<210>	29		
<211>	24		
<212>	DNA	•	
<213>	ARTIFICIAL SEQUENCE		
<220>			
<223>	SYNTHETIC DNA		
<400>	29		2.4
ggtgag	caga gccacaaggc ttcg		24
<210>	30		
<211>	24		

<213>				
<220> <223>	SYNTHETIC DNA			
<400> cgaagc	30 cttg tggctctgct cacc			24
010	21			
<210> <211>	31 23		* .	
<212> <213>	DNA ARTIFICIAL SEQUENCE			
<220> <223>	SYNTHETIC DNA			
<400>	31	·		2.7
agagac	acag cgcttcgtga ggc			23
<210>	32		•	
<211>	23			
<212> <213>	DNA ARTIFICIAL SEQUENCE			·
<213>	ARTIFICIAL SEQUENCE		•	
<220>				
<223>	SYNTHETIC DNA			
<400>	32			
ctcacg	aagc gctgtgtctc tgc			23
<210>	33			
<211>	27			
<212>			•	
<213>	ARTIFICIAL SEQUENCE		۳ ,	
<220>				
<223>	SYNTHETIC DNA	•		
<400>				2.5
gaacaa	ggct tgctgagtgg tttaaag			27
<210>	34			
<211>	27			•
<212>			•	
<213>	ARTIFICIAL SEQUENCE			
<220>				
<223>	SYNTHETIC DNA			
<400>	34			_
ctttaa	acca ctcagcaagc cttgttc			27

<210>	35		
<211>	27	•	
<212>	DNA '		
<213>	ARTIFICIAL SEQUENCE	•	
<220>			
	CIDIMUDATO DAS		
<223>	SYNTHETIC DNA	•	
	:		
<400>	35	•	
	tcg tgcgtggttt aaagttg	• **	27
caagge	reed racasadans admans		
<210>	36		
<211>	27		•
<212>	DNA	•	
<213>	ARTIFICIAL SEQUENCE		
<220>	•		
<223>	SYNTHETIC DNA		
\ L LJ/			
	,		
<400>	36		
caactt	taaa ccacgcacga agccttg		27
	•		
010	25		
<210>	37		
<211>	26		
<212>	DNA		
<213>	ARTIFICIAL SEQUENCE		
12207			
<220>			
<223>	SYNTHETIC DNA		
<400>	37		
			26
cttegt	gagt gggctaaagt tgactg		20
<210>			
<210>	38		
<211>	26		
<211> <212>	26 DNA		
<211>	26		
<211> <212>	26 DNA		
<211> <212>	26 DNA		
<211> <212> <213>	26 DNA ARTIFICIAL SEQUENCE	•	
<211><212><213>	26 DNA		
<211><212><213> 223	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA		
<211><212><213> 223 400	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38		
<211><212><213> 223 400	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA		26
<211><212><213> 223 400	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38		26
<211><212><213> 223 400	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38		26
<211> <212> <213> <223> <400> cagtca	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38 actt tagcccactc acgaag		26
<211> <212> <213> <220> <223> <400> cagtca	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38 actt tagcccactc acgaag		26
<211> <212> <213> <220> <223> <400> cagtca <210> <211>	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38 actt tagcccactc acgaag 39 41		26
<211> <212> <213> <220> <223> <400> cagtca	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38 actt tagcccactc acgaag 39 41		26
<211> <212> <213> <220> <223> <400> cagtca <210> <211> <212>	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38 actt tagcccactc acgaag 39 41 DNA		26
<211> <212> <213> <220> <223> <400> cagtca <210> <211> <212>	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38 actt tagcccactc acgaag 39 41		26
<211> <212> <213> <220> <223> <400> cagtca <210> <211> <212> <213>	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38 actt tagcccactc acgaag 39 41 DNA		26
<211> <212> <213> <220> <223> <400> cagtca <210> <211> <212>	26 DNA ARTIFICIAL SEQUENCE SYNTHETIC DNA 38 actt tagcccactc acgaag 39 41 DNA		26

<400:	> 39 agcaga aacacaaggc ttcgtcagtg gtttaaagtt g	•	41
35.5.			
	40		
<210		•	
<211			
<212			
<213	> ARTIFICIAL SEQUENCE		
	•		
<220			
<223	> SYNTHETIC DNA		
<400	> 40		
	tttaaa ccactgacga agccttgtgt ttctgctcac c		41
caac			•
		•	
<210	> 41		
<211			
<212	> DNA		
<213	> ARTIFICIAL SEQUENCE		
<220			
<223	> SYNTHETIC DNA		
<400			41
ggtg	agcaga gccacaaggc ttcgtgcgtg gtttaaagtt g		4.1
	·	•	
.010	d> 42		
<210 <211			
<211			
<212			
\213	NITTION OF STATE		
<220)>		
<223			
<400)> 42		0
caac	tttaaa ccacgcacga agccttgtgg ctctgctcac c		41
_			
<210			
<21			
	2> DNA		
<213	3> ARTIFICIAL SEQUENCE		
224	·		
<220	·		
<223	3> SININEITC DNA		
<400	0> 43		
GC 8 1	tcctttg tgaacaatgt gctc	•	24
904			
<21	0> 44		
<21			
<21			
	- PETTTOINI COCUENCE		

<220>	•		
<223>	SYNTHETIC DNA		
(2237	SININDITE DIVI	•	•
400			
<400>	44		24
gagcaca	attg ttcacaaagg atgc	·	24
	•		
	ø.		
<210>	45		
<211>	27		
<212>	DNA		
<213>	ARTIFICIAL SEQUENCE		
	·		
<220>		•	
<223>	SYNTHETIC DNA	,	
<400>	45	•	
			27
caagga	ttcg tcagtggttt aaagttg		
	•	•	
<210>	46	•	
<211>	27 · ·	• .	
<212>	DNA		
<213>	ARTIFICIAL SEQUENCE		
	•	•	
<220>			
<223>	SYNTHETIC DNA	•	
		·	
<400>	46		
	taaa ccactgacga agccttg		27
caucce	caaa coacogacga ageereg	•	
.010-	47		
<210>			
<211>	25		
<212>	DNA		
<213>	ARTIFICIAL SEQUENCE		
<220>			
<223>	SYNTHETIC DNA		
<400>	47		
ggattg	gact gaggtgcggt ggagg		25
	•		
<210>	48		
<211>	25		
<212>	DNA		
<213>	ARTIFICIAL SEQUENCE		
\Z1J/	That I de la company to the company		•
<220>			
	CYMPUETT C DNA		
<223>	SYNTHETIC DNA		
<400>	48		25
cctcca	ccgc acctcagtcc aatcc		25
<210>	49		
<211>	23		

<212>	DNA
<213>	ARTIFICIAL SEQUENCE
<220>	
<223>	SYNTHETIC DNA
	ı
<400>	
ggacag	ccag catccagcat cag
	•
<210>	50
<211>	23
<212>	
<213>	ARTIFICIAL SEQUENCE
<220>	•
<223>	SYNTHETIC DNA
<400>	
ctgatg	ctgg atgctggctg tcc